

## CLAIMS

1. A wireless network comprising:  
multiple first wireless nodes that transmit signals;  
multiple independent infrastructure nodes that receive the transmitted signals, wherein at least two infrastructure nodes receive a transmitted signal from a single first wireless node; and  
a module that combines at least two of the signals received at the multiple independent infrastructure nodes to estimate the signal transmitted by the single first wireless node.
2. The wireless network of claim 1 and further comprising a central controller that receives signals from the independent infrastructure nodes and contains the module that combines the signals.
3. The wireless network of claim 2 wherein the infrastructure nodes are hardwired to the central controller.
4. The wireless network of claim 2 wherein the infrastructure node comprises a wireless transceiver for communicating with the central controller.
5. The wireless network of claim 1 wherein the first wireless nodes comprise sensors, and wherein the signals they transmit are representative of a sensed parameter.
6. The wireless network of claim 1 wherein the signals are combined using a diversity technique.

7. The wireless network of claim 6 wherein wireless channel coefficients that are associated with the RF links between the first wireless node and the infrastructure nodes are used for combining the signals.
8. The wireless network of claim 7 wherein the diversity technique comprises maximal ratio combining.
9. The wireless network of claim 1 wherein one of the infrastructure nodes receives signals from other infrastructure nodes and combines the signals received by the multiple infrastructure nodes.
10. An infrastructure node for a wireless network, the infrastructure node comprising:
  - a first receiver that receives a transmitted signal from a wireless node;
  - a second receiver that receives signals from other independent infrastructure nodes representative of the transmitted signal from the wireless node that were received by the other independent infrastructure nodes; and
  - a module that combines signal received from the wireless node and the signals from the other independent infrastructure nodes to estimate the signal transmitted by the wireless node.
11. The infrastructure node of claim 10 wherein the infrastructure node is hardwired to a central controller.
12. The infrastructure node of claim 10 and further comprising a wireless transceiver for communicating with a central controller.
13. The infrastructure node of claim 10 wherein the signals are combined using a diversity technique.

14. The infrastructure node of claim 13 wherein wireless channel coefficients that are associated with the RF links between the wireless node and the infrastructure nodes are used for combining the signals.
15. The infrastructure node of claim 13 wherein the diversity technique is selected from a group consisting of maximal ratio combining, equal gain combining, selection combining and switching combining.
16. A infrastructure node for a wireless network, the infrastructure node comprising:
- means for receiving a transmitted signal from a wireless node;
  - means for receiving the signals from other independent infrastructure nodes representative of the transmitted signal from the wireless node; and
  - means for combining the signal received from the wireless node and the signals from the other independent infrastructure nodes to estimate the signal transmitted by the wireless node.
17. A wireless network comprising:
- means for transmitting low power wireless signals;
  - multiple means for receiving the transmitted signals, wherein at least two of such means receive a transmitted signal from a single first wireless node; and
  - means for combining at least two of the signals received at the multiple means for receiving the transmitted signals for estimating the signal transmitted by the single first wireless node.
18. A method of processing signals at a infrastructure node for a wireless network, the infrastructure node performing the method comprising:
- receiving a transmitted signal from a wireless node;
  - receiving the signals from other independent infrastructure nodes representative of the transmitted signal from the wireless node; and

combining the signal received from the wireless node and the signals from the other independent infrastructure nodes to estimate the signal transmitted by the wireless node.

19. A method of processing signals in a network having multiple independent infrastructure nodes and multiple nodes, the method comprising:

transmitting a signal from a first wireless node;

receiving the transmitted signal, wherein at least two infrastructure nodes receive the transmitted signal from the single first wireless node; and

combining the signals received by at least two of the multiple independent infrastructure nodes to estimate the signal transmitted by the single first wireless node.

20. The method of claim 19 wherein combining is performed by a central controller that receives signals from the independent infrastructure nodes.

21. The method of claim 19 wherein the signals are combined using a diversity technique.

22. The method of claim 21 wherein wireless channel coefficients that are associated with the RF links between the first wireless node and the infrastructure nodes are used for combining the signals.

23. The method of claim 22 wherein the diversity technique comprises maximal ratio combining.